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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/560,329

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Jung Moon Kim

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04/10/2008

INTELLECTUAL PROPERTY / TECHNOLOGY LAW

PO BOX 14329

RESEARCH TRIANGLE PARK, NC 27709

EXAMINER

MACFARLANE, STACEY NEE

ART UNIT

PAPER NUMBER

1649

MAIL DATE

DELIVERY MODE

04/10/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                   |  |
|------------------------------|--------------------------------------|-----------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/560,329 | <b>Applicant(s)</b><br>KIM ET AL. |  |
|                              | <b>Examiner</b><br>STACEY MACFARLANE | <b>Art Unit</b><br>1649           |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-20 and 23-28 is/are pending in the application.
- 4a) Of the above claim(s) 10-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-9 and 18-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/27/2008</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Claims 1 and 18 have been amended, claims 3, 4, 21 and 22 have been cancelled and claims 23-28 have been newly added as requested in the amendment filed on January 28, 2008. Following the amendment, claims 1, 2, 5-20 and 23-28 are pending in the instant application.

Claims 10-17 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper filed on January 28, 2008.

Claims 1, 2, 5-9, 18-20 and 23-28 are under examination in the instant office action.

2. Any objection or rejection of record, which is not expressly repeated in this action has been overcome by Applicant's response and withdrawn.

3. Applicant's arguments filed on January 28, 2008 have been fully considered but they are not deemed to be persuasive for the reasons set forth below.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-9 and 18-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 2004/197867 A1, further in view of US Patent 5,013,649 and the Leighton et al. reference, for reasons of record as applied to claims 1-9 and 18-20 in the previous Office Action mailed September 27, 2007.

On pages 9-14 of Remarks filed January 28, 2008, Applicants traverse the rejection on the following grounds. Applicants state that Example 1 (pages 25-28 of the instant specification) demonstrate that hBMP-TAT is cell permeable (Figure 10) but does not retain activity, but the fusion of hBMP with FAD and PTD (as claimed) provides that the 3-dimensional structure of hBMP need no longer be maintained to preserve activity (page 10). This is not found persuasive for the following reasons.

Examiner maintains that the '649 Patent and Leighton reference had already disclosed that it was known in the art that the "furin activation domain" (FAD), comprising an amino acid sequence of the instantly-elected SEQ ID NO: 14, fused with the "tissue regeneration domain" (TRD), comprising an amino acid sequence of the instantly-elected SEQ ID NO: 1, is the equivalent of the hBMP proprotein. Further, the references teach that the domain comprising SEQ ID NO: 14 constitutes a cleavable

RX(K/R)R domain that is essential for BMP procollagen C-proteinase activity, and in the absence of this cleavable domain, BMP protein is expressed and secreted but has no C-proteinase activity.

Applicants further traverse that the '867 publication "merely suggests" (Remarks page 10, paragraph 3) fusion polypeptides comprising PTD fused to BMP2 and TGF-beta, among others, but that the reference does not show actual experimental data carried out by binding PTD with BMP. While this argument has been fully considered it is not found persuasive for the following reasons.

The claimed invention is a fusion protein product comprising a protein transduction domain (PTD) comprising HIV-TAT fused with the instantly-elected BMP2 Of SEQ ID NO: 1. The '867 publication discloses a fusion protein comprising PTD, specifically TAT, fused to BMP2. Thus, the reference discloses BMP2 fused with the PTD of TAT. Experimental data is not necessary for anticipation of the polypeptide.

Applicants further argue that the '867 publication "asserts that bone formation will be induced" (Remarks page 11, paragraph 1) but that the reference does not correctly describe the mechanisms by which PTD-BMP would achieve this result. Also, Applicants argue that the '867 publication fails to suggest intracellular delivery of the fusion protein, but that "the present invention concretely suggests transfer of secreted protein BMP to cells, the processes of cleavage and activation by furin in cells and the secretion of activation protein" (Remarks page 12, first paragraph). Examiner asserts that any results such as bone regeneration, intracellular delivery, and protein activity are merely inherent features of the fusion polypeptide product. If indeed these functional

Art Unit: 1649

limitations structurally alter the claimed fusion protein then it is upon the Applicant to demonstrate the structural difference. If the patented product and the claimed product are substantially the same then any non-structural discrepancy of function between the product as disclosed in the prior art and that of the claimed invention raises potential issues of lack of enablement. Thus, the product invention as a whole is *prima facie* obvious, if not actually anticipated by the references.

The burden of proof rests upon the Applicant to demonstrate that the prior art does not necessarily or inherently possess the characteristics of Applicant's claimed product. *In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977)). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). There is nothing of record to indicate that the prior art product Applicant has not demonstrated

### ***Conclusion***

7. No Claim is allowed.
8. This application contains claims drawn to an invention nonelected without traverse in Paper filed on July 23, 2007.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action. Any inquiry concerning this communication or earlier communications from the examiner should be directed to STACEY MACFARLANE whose telephone number is (571)270-3057. The examiner can normally be reached on M,W and ALT F 7 am to 3:30, T & R 5:30 -5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Stucker can be reached on (571) 272-0911. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1649

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Stacey MacFarlane  
Examiner  
Art Unit 1649

/Olga N. Chernyshev, Ph.D./  
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